



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA STREET, N.W.  
 ATLANTA, GEORGIA 30323

OCT 26 1989

Report Nos.: 50-327/89-24 and 50-328/89-24

Licensee: Tennessee Valley Authority  
 6N38 A Lookout Place  
 1101 Market Street  
 Chattanooga, TN 37402-2801

Docket Nos.: 50-327 and 50-328

License Nos.: DPR-77 and DPR-79

Facility Name: Sequoyah 1 and 2

Inspection Conducted: September 27-29, 1989

Inspector: T. R. Collins

10/25/89  
 Date Signed

Approved by: J. P. Potter  
 J. P. Potter, Chief  
 Facilities Radiation Protection Section  
 Emergency Preparedness and Radiological  
 Protection Branch  
 Division of Radiation Safety and Safeguards

10/25/89  
 Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the area of the radiation protection program follow-up on previous inspector identified items and employee safety concerns.

Results:

Based on interviews and records review, with licensee management, supervisors, and staff, the inspector found the radiation protection program to be generally adequate; however, one inspector follow-up item was identified: review the licensee's corrective actions for controlling work after changes in radiological conditions, such as occurred during an unanticipated steam release from the CVCS system into the Auxiliary Building on August 15, 1989.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*E. Aslinger, Quality Assurance Auditor
- \*M. Cooper, Compliance Licensing Supervisor
- \*G. Hipp, Licensing Engineer
- S. Holderfer, Health Physicist
- C. Kent, Radiological Protection Supervisor
- S. Koss, Radwaste Controller
- \*J. LaPoint, Site Director
- M. Palmer, Radiological Health Manager
- J. Stiegleman, Health Physicist
- \*M. Sullivan, Radiological Control Superintendent
- \*C. Vondra, Plant Manager
- \*K. Whittenburg, Media Relations

Other licensee employees contacted during this inspection included engineers, operators, mechanics, technicians, and administrative personnel.

#### Nuclear Regulatory Commission

- P. Harmon, Senior Resident Inspector
- K. Jenison, Senior Resident Inspector
- D. Loveless, Resident Inspector

\*Attended exit interview

### 2. Occupational Exposure, Shipping, and Transportation (83750)

#### a. Organization and Staffing

Technical Specification (TS) 6.2 specifies minimum plant staff and Final Safety Analysis Report (FSAR) Chapters 12 and 13 also outline further details on staffing.

The inspector reviewed with the Radiological Controls Superintendent and radiological control staff, recent changes to the plant health physics (HP) organization. The effect on radiological controls was determined by examining the changes to administrative procedures and position descriptions. The inspector also discussed authorized staffing levels versus on-board staffing with the Radiological Controls Superintendent. The inspector concluded that the licensee's current staffing and experience levels of the radiological controls section were adequate to support routine plant operations.

No violations or deviations were identified.

b. Control of Radioactive Materials and Contamination, Surveys and Monitoring

The inspector was informed of an event on August 15, 1989, where airborne radioactivity was released on the 690 foot elevation in the Auxiliary Building and the area was evacuated as a precautionary measure. The inspector discussed this event with licensee management and was informed that Work Request No. B-794653 was issued to replace missing parts on Chemical Volume Control System (CVCS) valve no. 1-62-946. This valve is located on the CVCS ion exchanger and filter header at the discharge of ion exchanger "A" in the Holdup Tank Valve Gallery (690 foot elevation Auxiliary Building). Hold Order No. 1-89-531 was issued by Operations to a Mechanical Maintenance foreman for this work. This hold order closed boundary valves around the valve to be worked, and should have isolated it. No venting or bleeding mechanism was available to relieve residual pressure from the isolated valve and pipe section. At approximately 0330 hours, a Radiological Control (RADCON) technician and a Mechanical Maintenance fitter entered the Holdup Tank Valve Gallery to perform the work. Upon initial breach of the valve, water under pressure was released to a containment device (plastic bag) established for this job. This pressure and a small amount of liquid were anticipated because of the inability to vent or bleed residual pressure from the isolated valve and pipe section prior to system breach. After deliberation by the technician and fitter, the valve was breached again. Steam under pressure was actually released to the containment device this time. However, it was not apparent (audibly or visually) to the technician and fitter. This breach lasted for approximately one minute, at which time RADCON technicians noted upscale radiation instrument readings both within and outside of the valve gallery. This was the first indicator recognized by the technician and fitter, of an airborne problem occurring. The valve was then closed to terminate the pressure release, and the personnel exited the valve gallery. Air samples from the valve gallery during the breach recorded noble gas concentrations at 2.6 times Maximum Permissible Concentration (MPC). General area air samples on the 690 foot Auxiliary Building elevation recorded noble gas concentrations at 38 percent of MPC. No radioactive particulates or iodines were released to either of these locations according to air sample results subsequently obtained by RADCON technicians.

RADCON advised the Operations Shift Supervisor of an airborne radioactivity problem following the upscale instrument readings taken by the RADCON technicians at the work site. The Operations Shift Supervisor ordered an evacuation of the 690' elevation of the Auxiliary Building. This elevation was posted as an "Airborne Radioactivity Area" and "Radiation Work Permit (RWF) Required for Entry" for approximately two hours following the event. Whole body

contamination monitors (Betamax units) initially indicated contamination on the valve gallery personnel and other personnel who had been on the 690 foot elevation. Air sample assessment and RADCON monitoring of these individuals indicated this to be from short lived noble gases. No recordable personnel contaminations above station limits, no personnel uptakes of radioactivity, or unanticipated whole body radiation exposure took place during this work. No procedure violations took place during this work.

At this point, a Radiological Protection engineer was requested by Work Control to perform an SQA 186 Root Cause Analysis and an AI 18.18 Reporting of Abnormal Events. During the course of this investigation, but not in conjunction with the investigation, two more attempts were made at breaching the valve and relieving pressure within it. These additional breaches were requested by the Operations Group and coordinated by the Work Control Group.

A five minute valve breach during the evening of August 15 released 8.9 times MPC of noble gas within the valve gallery, 11.7 times MPC on the 690 foot elevation, and 1.99 times MPC to the 714 foot elevation. Prior to this second breach, the Operations group reperformed closure of the hold order boundary isolation valves. During this breach, a portable ventilation unit with duct work was used in an attempt to direct the noble gas to the process ventilation system. Pressure from the valve remained constant during this breach. In the early morning hours of August 17, at the direction of the Operations Shift Supervisor, a third valve breach was attempted. Prior to this breach, additional boundary valves were closed to create a double isolation on valve 1-62-946. The valve was breached for five minutes utilizing a containment device around the valve, a containment tent and portable ventilation with duct work to direct the gas to process ventilation. Pressure from the valve remained constant during this breach. Noble gas concentrations of 34 percent of MPC were recorded within the containment tent and 17 percent of MPC outside of the containment tent. A contact dose rate of 2,975 millirem per hour beta and 5 millirem per hour gamma was recorded on the duct work directing the gas to process ventilation. The containment tent, bag, and duct work were extremely effective in containing and directing the released noble gas. No personnel contamination, uptakes of radioactivity, or unanticipated whole body radiation exposures occurred during the latter two breaches. No radioactive particulates or iodines were released from either of these breaches. "Airborne Radioactivity Area" signs were posted when posting criteria (greater than 25 percent of MPC) occurred after the latter two breaches.

At mid-morning on August 17, RADCON cancelled the RWP for this valve repair work. On August 15, the Root Cause Analysis performed by Radiological Protection identified a defective boundary valve as a root cause for inability to relieve pressure from the valve of concern. On August 18, an action plan (SQA 211, Formalized Action

Plan) was devised by System Engineering, Mechanical Maintenance, and RADCON. This plan would allow the valve to be returned to service and the use of ion exchanger "A" by the CVCS system. Repair of the valve was postponed, and will include inspection and adjustment of boundary isolation valves in order to achieve complete closure and isolation. If the inspection and adjustment of boundary valves is not successful, then freeze plug operations to isolate the valve will be implemented.

The licensee's immediate corrective actions are summarized below:

The initial system breach was terminated when RADCON detected an airborne problem. The 690 foot elevation of the Auxiliary Building was evacuated following the first valve breach. The second and third breaches were terminated when the valve failed to depressurize. RADCON obtained air samples for all applicable airborne radioactivity types at the work site and at general area sites on various elevations of the Auxiliary Building following all valve breaches. Personnel were monitored for contamination by RADCON following each valve breach. Portable ventilation was installed for the second valve breach. A tent and portable ventilation was used for the third valve breach. RADCON instituted "Airborne Radioactivity Area" postings for Auxiliary Building areas when posting criteria (greater than 25 percent of MPC) was met.

The licensee's findings and final corrective actions are summarized below:

- a. SQA 211, Formalized Action Plan, was used to document the following action plan.
  1. A decision by the Operations Group on the CVCS valve status (use as is or repair), was to be made.
  2. If repair is required, inspect and adjust all boundary isolation valves.
  3. If unsuccessful with inspection and adjustment of boundary valves, then utilize freeze plug operations to isolate the CVCS valve (1-62-946).
  4. Repair valve by normal methods following complete isolation achieved by 2. or 3. above.
- b. Additional valve breaches without input from the investigation team would be permitted, as required, following:

Establishment of a method to hold work which is still awaiting a root cause analysis.

The inspector discussed the licensee's corrective actions with licensee management representatives and concluded that their corrective action plan appeared to be adequate. However, at the time of the inspection, corrective actions had not been taken. The inspector noted to licensee management that allowing work to continue without completing a root cause analysis could increase health and safety risk to personnel performing work. Licensee management acknowledged the inspector's comments and stated this issue would be evaluated and corrective actions would be forthcoming. The inspector informed licensee management that corrective actions for this event would be tracked as an inspector follow-up item (IFI) and would be reviewed during subsequent inspections (IFI 50-327, 328/89-24-01).

No violations or deviations were identified.

3. Follow-up on Employee Concerns Program (99014)

Allegation Number OSP-89-A-0003, Employee Concern was in the area of radwaste shipments. The concern dealt with the possible shipment of unsolidified evaporator bottoms to a licensed burial site.

Discussion and Finding

The inspector reviewed the licensee's investigation report of this event Employee Concern Program (ECP) 89-SQ-020-01 and concluded that the licensee had performed an adequate evaluation of the concern. The licensee's finding of shipping unsolidified evaporator bottoms to a licensed burial site was substantiated. The reason for the concern was the fact that the licensee could not conclusively determine the contents of the shipment. The inspector reviewed the radioactive shipping record of this shipment and determined that the contents of the shipment was flammastic insulation and not evaporator bottoms. The inspector concluded that the shipment met Class "A," unstable waste requirements, no free standing liquid, as required by 10 CFR 61.55(a). Class A - Unstable Waste, when properly processed under 10 CFR 61.56(a), is not required to meet the provisions of 10 CFR 61.56(b) concerning stability. Therefore, the concern of improper shipping of unsolidified waste for burial is not substantiated.

No violations or deviations were identified.

4. Follow-up on Previous Inspector Enforcement Items (92702)

(Closed) Violation 50-327, 328/89-11-01: This item concerned the failure of personnel to evacuate an area when area radiation monitors (ARMs) alarm. The inspector reviewed and verified, as adequate, the licensee's corrective action as stated in TVA's letter dated September 7, 1989.

## 5. Exit Interview

The inspection scope and results were summarized on September 29, 1989, with those persons indicated in Paragraph 1. The inspector summarized the areas inspected and discussed in detail the inspection results described above. The licensee acknowledged the inspection findings and took no exceptions. Licensee management was informed of the status of the previous enforcement issue discussed in Paragraph 4. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspection during the inspection.

<u>Item Number</u>	<u>Description and Reference</u>
50-327, 328/89-24-01	IFI - Review corrective actions for work control practices that involve potential for changing radiological conditions (Paragraph 2.b).